Spontaneous optical patterns in an atomic vapor: Observation and simulation
W. Lange, Yu.A. Logvin and T. Ackemann 230

Resonances and instabilities in a bidirectional ring laser
C. Mathis, C. Taggiasco, L. Bertarelli, I. Boscolo and J.R. Tredicce 242

Generation of one-dimensional optical turbulence
F. Mitschke, G. Steinmeyer and A. Schwache 251

Optical pattern formation in a Kerr-like medium with feedback
P.L. Ramazza, E. Pampaloni, S. Residori and F.T. Arecchi 259

Characterization of localized transverse structures in wide-aperture lasers
N.N. Rosanov, A.V. Fedorov, S.V. Fedorov and G.V. Khodova 272

Spatio-temporal dynamics due to competing spatial instabilities in a coupled LCLV feedback system
B. Thüring, A. Schreiber, M. Kreuzer and T. Tschudi 282

Chapter 4. Applications to biological and ecological systems

Wavelet based fractal analysis of DNA sequences
A. Arneodo, Y. d'Aubenton-Carafa, E. Bacry, P.V. Graves, J.F. Muzy and C. Thermes 291

Detecting nonlinear dynamics in spatio-temporal systems, examples from ecological models
S. Little, S. Ellner, M. Pascual, M. Neubert, D. Kaplan, T. Sauer, H. Caswell and A. Solow 321

Synchronous oscillatory activity in assemblies of chaotic model neurons
J. Güémez and M.A. Matías 334

Entropy quantification of human brain spatio-temporal dynamics
L. Pezard, J. Martinerie, J. Müller-Gerking, F.J. Varela and B. Renault 344

Modeling the functional organization of the visual cortex
L. Sirovich, R. Everson, E. Kaplan, B.W. Knight, E. O'Brien and D. Orbach 355

Chapter 5. Applications to other systems

Stable states and kink dynamics in a system of coupled diode resonators
G.A. Johnson, M. Löcher and E.R. Hunt 367

Effect of boundary conditions in mode I fracture in brittle materials
P. Español, I. Zúñiga and M.A. Rubio 375

Instabilities in the growth of compact electrodeposits
J.M. Pastor and M.A. Rubio 384

Three-dimensional reconstruction of scroll waves in the Belousov–Zhabotinsky reaction using optical tomography
D. Stock and S.C. Müller 396

List of contributors 404